COMMENT

Reply to Comment on ‘Stark broadening parameters predictions and regularities of singly ionized lead’

C Colón

A Alonso-Medina

Abstract

The systematic trends of Stark widths across spectral series of Pb II are discussed.

In his comment on ‘Stark broadening parameters predictions and regularities of singly ionized lead’ [1], Konjević has highlighted distortions of the width trends across some spectral series of Pb II obtained when using linewidths in wavelength units. We would like to thank Konjević for bringing this to our attention. In our data presented in the article under discussion [2], the series $7s^2S_{1/2}-np^2P_{1/2,3/2}$ and $7p^2P_{1/2,3/2}-ns^2S_{1/2}$ show the small distortion indicated by Konjević at all temperatures. However, the series $6p^2P_{1/2,3/2}-ns^2S_{1/2}$ is only affected at low temperatures and the series $6p^2P_{1/2,3/2}-nd^2D_{3/2,5/2}$ is not affected at all. Examples of this are shown in figures 1–3.

Figure 1. The Stark FWHM (ω) for the $6p^2P_{3/2}-ns^2S_{1/2}$ lines of Pb II versus the principal quantum number of the upper state.

Figure 2. The Stark FWHM (ω) for the $7p\ ^2P_{3/2} - ns\ ^2S_{1/2}$ lines of Pb II versus the principal quantum number of the upper state.

Figure 3. The Stark FWHM (ω) for the $6p\ ^2P_{1/2} - nd\ ^2D_{3/2}$ lines of Pb II versus the principal quantum number of the upper state.

One of the authors of this work, Alonso-Medina, has published additional work relating to the regularities described above [3] that concurs with the findings of Konjević. With the Pb II data our intention was to present an example of the internal coherence of our calculations. The increasing trend of Stark widths across the spectral series may be expected from the semiempirical approach used in these calculations, as indicated by Konjević. No new experimental data were available at the time of our previous calculations [4], so we were unable to detect the presence of, or lack of, the regularities.

Acknowledgment

We reiterate our thanks to Dr Konjević for bringing this to our attention and we will consider his valuable advice in future works.